

ABSTRACT OF THE DISCLOSURE

A MOS transistor suitable for microscopic applications and a fabrication method thereof are disclosed. The fabrication method includes forming a trench by selectively etching a semiconductor substrate; forming a channel region consisting of a silicon layer with a predetermined width in the bottom of the trench and forming a gate oxide film on the channel region; forming a SiGe film on the gate oxide film and within the trench and burying the trench; forming a gate groove with a predetermined width to expose the gate oxide film by selectively etching the SiGe film; and forming a gate electrode by forming a silicon layer on the exposed gate oxide film such that the gate groove is buried.